In re Patent Application of:
WALTERS ET AL.
Serial No. **Not Yet Assigned**
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In the Claims:

1. (CURRENTLY AMENDED) A DC-to-DC converter comprising:

at least one power switch;

a pulse width modulation circuit for generating control pulses for the at least one power switch;

an output inductor connected to the at least one power switch;

a thermally compensated current sensor connected in parallel to the output inductor and comprising a resistor and capacitor connected in series for sensing current in the output inductor, the thermally compensated current sensor having a temperature coefficient that substantially matches a temperature coefficient of the output inductor; and

a current feedback loop circuit cooperating with the pulse width modulation circuit for controlling the at least one power switch responsive to the thermally compensated current sensor.

2. (ORIGINAL) A DC-to-DC converter according to Claim 1 wherein the at least one power switch comprises at least one field effect transistor.

3. (ORIGINAL) A DC-to-DC converter according to Claim 1 wherein the at least one power switch comprises a low side field effect transistor and a high side field effect transistor connected together.

4. (ORIGINAL) A DC-to-DC converter according to Claim 1 wherein the at least one power switch comprises a low side power switch and a high side power switch connected together.

5. (CANCELLED)

6. (CURRENTLY AMENDED) A DC-to-DC converter according to ~~Claim 5~~ Claim 1 wherein the resistor of the thermally compensated current sensor comprises a positive temperature coefficient resistor.

7. (ORIGINAL) A DC-to-DC converter comprising:

at least one power switch;

a pulse width modulation circuit for generating control pulses for the at least one power switch;

an output inductor connected to the at least one power switch;

a thermally compensated current sensor connected to the at least one power switch for providing a sensed current related to a current being conducted through the output inductor, the thermally compensated current sensor having a temperature coefficient that substantially matches a temperature coefficient of an on-state resistance of the at least one power switch;

a current feedback loop circuit cooperating with the pulse width modulation circuit for controlling the at least one power switch responsive to the thermally compensated current sensor.

8. (ORIGINAL) A DC-to-DC converter according to Claim 7 wherein the at least one power switch comprises at least one field effect transistor.

9. (ORIGINAL) A DC-to-DC converter according to Claim 7 wherein the at least one power switch comprises a low side field effect transistor and a high side field effect transistor connected together.

10. (ORIGINAL) A DC-to-DC converter according to Claim 7 wherein the at least one power switch comprises a low side power switch and a high side power switch connected together.

11. (ORIGINAL) A DC-to-DC converter according to Claim 7 wherein the thermally compensated current sensor is connected between the at least one power switch and the current feedback loop circuit, and the thermally compensated current sensor comprises a resistor.

12. (ORIGINAL) A DC-to-DC converter according to Claim 11 wherein the resistor of the thermally compensated current sensor comprises a positive temperature coefficient resistor.

13. (ORIGINAL) A multiphase DC-to-DC converter comprising:

at least first and second channels each comprising

a power device including a low side power switch and a high side power switch connected together,

a pulse width modulation circuit for generating control pulses for the power device;

an output inductor connected to the power device,

a thermally compensated current sensor connected to the power device for providing a sensed current related to a current being conducted through the output inductor, the thermally compensated current sensor having a temperature coefficient that substantially matches a temperature coefficient of an on-state resistance of the low side power switch,

a current feedback loop circuit cooperating with the pulse width modulation circuit for controlling the power device responsive to the thermally compensated current sensor.

14. (ORIGINAL) A multiphase DC-to-DC converter according to Claim 13 wherein each of the power switches comprises a field effect transistor.

15. (ORIGINAL) A multiphase DC-to-DC converter according to Claim 13 wherein the thermally compensated current sensor is connected between the power device and the current feedback loop circuit, and the thermally compensated current sensor comprises a resistor.

16. (ORIGINAL) A multiphase DC-to-DC converter according to Claim 15 wherein the resistor of the thermally compensated current sensor comprises a positive temperature coefficient resistor.

17. (ORIGINAL) A multiphase DC-to-DC converter comprising:

at least first and second channels each comprising

a power device including a low side power switch and a high side power switch connected together,

a pulse width modulation circuit for generating control pulses for the power device;

an output inductor connected to the power device,

a current sensor connected to the power device for providing a sensed current proportional to a current being conducted through the output inductor,

a current feedback loop circuit cooperating with the pulse width modulation circuit for controlling the power device responsive to the current sensor; and

a feedback resistive network connected between an input of the pulse width modulation circuit of each of the at least first and second channels and the output terminal, and comprising a negative temperature coefficient resistor having a temperature coefficient that substantially matches a temperature coefficient of an on-state resistance of the low side power switch of the power device of the at least first and second channels.

18. (ORIGINAL) A multiphase DC-to-DC converter according to Claim 17 wherein each of the power switches comprises a field effect transistor.

Claims 19-28 (CANCELLED)